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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,264	01/03/2002	Seungbae Park	EN999048D	8328

7590 01/02/2004

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EXAMINER

GARCIA, ERNESTO

ART UNIT	PAPER NUMBER
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3679

DATE MAILED: 01/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/038,264

Applicant(s)

PARK ET AL.

Examiner

Ernesto Garcia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-14 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____



DETAILED ACTION

Drawings

The drawings were received on 9/8/03. These drawings are not acceptable.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "15" has been used to designate both a planar intermetallic boundary (Figure 2) and a non-planar intermetallic boundary (Figure 4); and reference character "10" has been used to designate a pad having a rectangular cross section (Figure 1) and a pad having a non-rectangular cross-section (Figure 4). Applicant is reminded that the pad in Figure 4 should be referenced as 16, as the pad shown in Figure 3a is used in Figure 4, instead of 10.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:

27. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application.

The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 9 and 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 9 and 10, the limitation "said surface being disposed within an intermetallic region encompassing said surface of said pad and said solder" is not in the specification. In order to place the surface within something, the surface has to be disposed between two boundaries or points of reference. The drawings don't show the surface disposed within an intermetallic region. The drawings show the surface adjacent to the solder. The only possibility that Figure 4 allows is to make the solder 25 define an upper boundary and make the bottom surface 16b of the pad 16 define a lower boundary (see attachment). This allows the surface to be disposed within those boundaries. So far, the invention has defined the region encompasses the surface of the pad and the solder together, which the region will be regarded as a first boundary.

Since a second boundary is missing, there is no reference where the surface is located in respect to the region just defined above as the surface is part of the region.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishamura et al., JP-62-15844.

Regarding claim 9, Japanese patent '844 discloses a solder configuration comprising a pad **2** and solder **12**. The pad **2** has a surface **A2** characterized as non-planar and circuitous. The surface **A2** is disposed within an intermetallic region **A3** encompassing the surface **A2** of the pad **2** and the solder **12**.

Applicant is reminded that the pad **2** is adapted to receive the solder **12** thereby forming a portion of a solder joint. Furthermore, applicant is reminded that the pad is able to allow a crack to be formed in the solder proximate a boundary with the intermetallic region **A3** and be influenced to proceed in a direction substantially parallel to the surface **A2**, thereby lengthening its travel and prevent failure of the solder joint.

Regarding claim 10, a solder configuration comprising a pad **2** and solder **12**. The pad **2** has a surface **A2** characterized as non-planar, serpentine surface. The surface **A2** is disposed within an intermetallic region **A3** encompassing the surface **A2** of the pad **2** and the solder **12**.

Applicant is reminded that the pad **2** is adapted to receive the solder **12** thereby forming a portion of a solder joint. Furthermore, applicant is reminded that the pad is able to allow a crack to be formed in the solder proximate a boundary with the intermetallic region **A3** and be influenced to proceed in a direction substantially parallel to the surface **A2** along a non-planar and serpentine path, thereby lengthening its travel and prevent failure of the solder joint.

Response to Arguments

Applicant's arguments filed 10/14/03 have been fully considered but they are not persuasive.

Applicant has argued that the function of the structure of Japanese patent 62-15844, Nishamura et al., is to compensate for different thermal expansion among semiconductor materials. In response to applicant's argument, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed

invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Applicant has argued that the bond between semiconductor 6 and tab 1 is probably not subject to contact fatigue and that applicant's invention is a pad affixed to a substrate. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "the pad being subjected to contact fatigue" and "the pad being affixed to a substrate") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Furthermore, applicant has argued that unlike Nishamura et al., the applicant's structure is not designed to compensate for difference of CTE but to interrupt the spread of micro-cracks since the structure are completely different. Again, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Moreover, if applicant believes the

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structures are different, applicant should state which structural recitation or features the Japanese patent fails to show.

Conclusion

The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Japanese patent, 61,210812 shows a similar solder configuration.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ernesto Garcia whose telephone number is 703-308-8606. The examiner can normally be reached from 8:30-5:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne H Browne can be reached on 703-308-1159. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9326 for regular communications and 703-872-9327 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-2168.


Lynne H. Browne
Supervisory Patent Examiner
Technology Center 3600

E.G.

December 15, 2003

Attachments: one marked-up copy of applicant's Figure 4; and,
one marked-up copy of Japanese patent, JP-62-15,844.



